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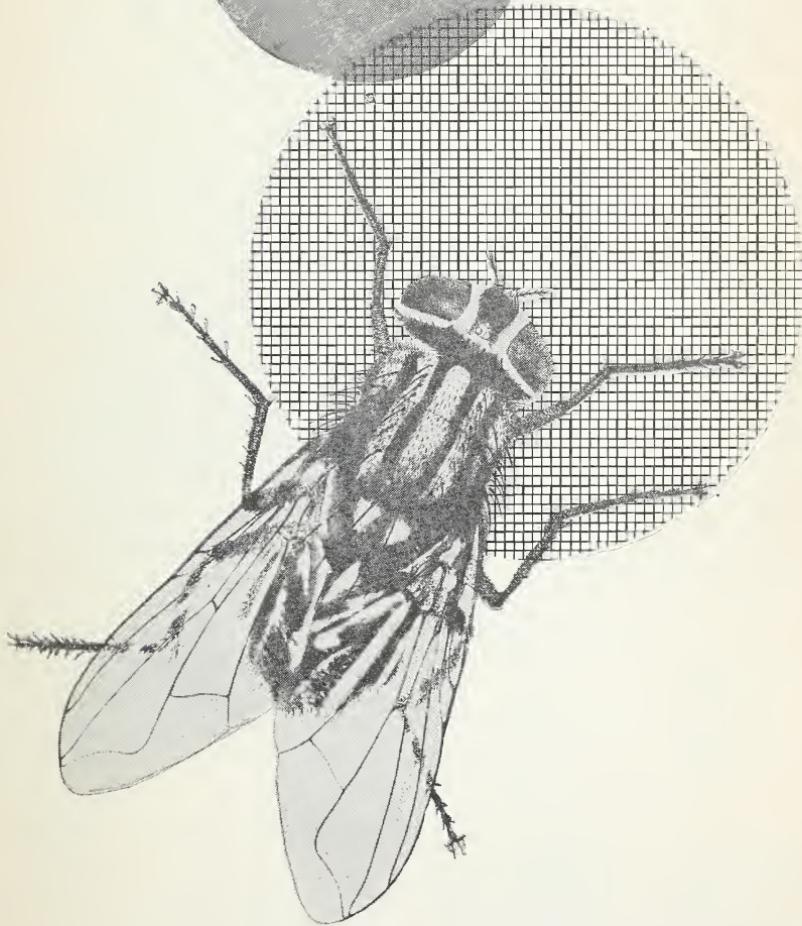
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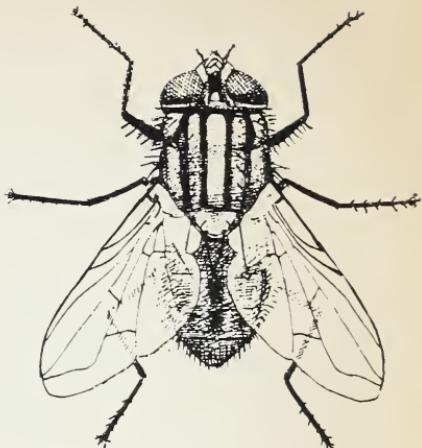


Leaflet No. 390

U.S. DEPARTMENT OF AGRICULTURE

the HOUSE FLY

how to control it



The house fly¹ is a danger to the health of man and animals principally because it carries and spreads disease germs that may be in the materials it breeds in, feeds on, or walks on.

This fly feeds and breeds most extensively in manure, garbage, and fermenting crop wastes. If disease germs are in these materials, or in others that they frequent, the flies get them on their hairy legs and feet and in their digestive tracts. If the flies have access to man's food, they contaminate it by walking over it and by leaving their excreta on it.

By contaminating food and water and by coming in direct contact with the hands and mouth, the flies spread typhoid, dysentery, and diarrhea. They have a part in spreading cholera, yaws, trachoma, and many other diseases. They can transmit the eggs of various parasitic worms.

To control the house fly in and around the home and on the farm, do these things:

Eliminate the flies' breeding places. Follow sanitary practices constantly. Keep garbage and other refuse under cover; dispose of garbage frequently. On the farm, dispose of manure properly.

Screen windows and doors of the home and of dairy barns and milk rooms.

Kill flies. Use space and surface sprays in and around the home. Use space sprays, surface sprays, and poisoned baits in and around farm buildings. (Electric grids and traps are effective fly-killing devices in some circumstances.)

In the pages that follow, fly control is discussed under these headings: Sanitation, Screens, Insecticides, Poisoned Baits, Manure Disposal, and Grids and Traps.

¹ *Musca domestica.*

SANITATION

Despite advances in the development of insecticides, sanitation continues to be the mainstay of housefly control in and around the home and on the farm.

Flies breed in places where garbage or filth accumulates. Find and eliminate such places. Clean up. Bury or otherwise dispose of dog, cat, and chicken excreta around the yard.

Make sure you have tight-fitting lids on garbage cans.

Do not let garbage accumulate in the open. Do not let it stand until it ferments; insist on frequent pickups. Burn it if it cannot be disposed of in any other way.

SCREENS

Well-fitting screens on windows and doors are essential for keeping flies out of homes, dairy barns, and milkrooms. See that screened doors swing outward.

In a humid climate, use screens of copper, aluminum, bronze, plastic, or one of the rust-resisting alloys. In a dry climate, you can use galvanized screens.

Screens with 14 meshes to the inch will keep out house flies, but 16-mesh screens will keep out some other insects also.

INSECTICIDES

To kill flies quickly inside the home, use an insecticide in a space spray (or in an aerosol). Outside the house, apply a surface, or residual, spray

to garbage cans, screens, porches, door and window frames, edges of arches, and other places where flies gather, or use a poisoned bait.

A surface spray may also be used inside the home; but if a house is well screened, and a surface spray has been used outside, it is usually easier to kill flies indoors with a space spray.

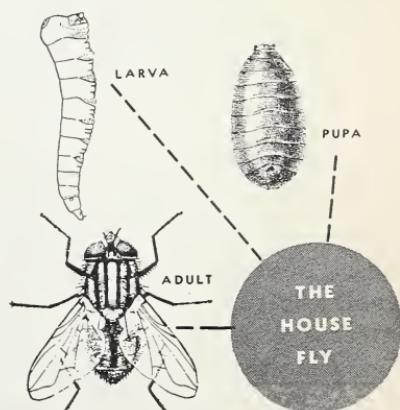
To kill flies in and around farm buildings, apply a surface spray. Apply it to the inside and outside of stables, dairy barns, hog houses, poultry houses, and other buildings in which livestock are kept. A space spray may also be used. (See precautions.)

Space Sprays

Several kinds of ready-to-use space sprays for killing flies inside the home and barn may be purchased. Buy the best-grade sprays from a reputable dealer.

Look for space sprays of the following types:

- Those that contain pyrethrins plus a synergist. (The synergist increases the effectiveness of the pyrethrins. Some of the synergists are piperonyl butoxide,



n-propyl isome, and sesame oil.) Some sprays of this type also contain DDT, methoxychlor, or lindane. (See precautions for barn use.)

● Those that contain Lethane 384 or Thanite. Some sprays of this type also contain pyrethrins, DDT, methoxychlor, or lindane. (See precautions for barn use.)

● Aerosol "bombs" that contain the above insecticides, provided the labels say that the contents are for use against flying insects.

● Aerosol bombs containing 0.5 percent of DDVP. In barns, this treatment can be used only when the animals have not been directly treated with DDVP (for control of some other insect) within the previous 8 hours.

Other space sprays and aerosols can be used in homes, but not in barns:

● Those that contain 2 percent of malathion or 1 to 2 percent of ronnel.

● Aerosol bombs containing 5 percent of malathion or 0.4 percent of ronnel.

To kill flies in a room, release a mist from a hand or power sprayer or from an aerosol "bomb" for a few seconds, and keep the room closed for an hour.

Surface Sprays

Surface sprays leave a residue that may be effective for several weeks. Flies are killed when they come in contact with the residue.

Methoxychlor, lindane, malathion, Ciordrin, diazinon, Dibrom, dimethoate, DDVP, and ronnel

(Korlan) are recommended for use as surface sprays in barns. Do not apply Dibrom on animals or in poultry houses when birds are present; do not use lindane in poultry houses.

Apply DDVP spray at the rate of 1 quart per 1,000 square feet of surface. The other insecticides should be sprayed at the rate of 1 or 2 gallons per 1,000 square feet. Moisten the surfaces without causing runoff.

In treating farm buildings, use a power, compressed-air, or knapsack sprayer. The choice depends on the size of the area to be treated.

DDT and Methoxychlor

You can buy oil solutions containing 5 percent of DDT or methoxychlor.

These insecticides are also available in the form of wettable powders and emulsifiable concentrates. Make a 2.5-percent suspension (wettable powder and water) or a 5-percent emulsion (emulsifiable concentrate and water). To make the suspension, mix 2 pounds of a 50-percent wettable powder with 5 gallons of water.² To make the emulsion, mix 1 gallon of a 25-percent emulsifiable concentrate with 4 gallons of water.²

Ciordrin

Apply as a 0.3-percent emulsion spray. Mix 5 ounces of 38-percent emulsifiable concentrate in 5 gallons of water to make the proper concentration of insecticide.

² If the product you buy contains a lower or higher percentage of the insecticide, use proportionately more or less of it.

Dimethoate

Apply as a 1-percent emulsion spray. Mix 13 ounces of 4-pound-per-gallon concentrate in 5 gallons of water to make the proper concentration of insecticide.

DDVP

Apply as a 0.5-percent emulsion spray. Mix 6½ ounces of 4-pound-per-gallon emulsifiable concentrate in 5 gallons of water to make the proper concentration of insecticide.

Chlordane

You can buy a 2-percent chlordane preparation that is ready to use when purchased. Or you can make a 2-percent emulsion by mixing 1 pint of a 50-percent emulsifiable concentrate with 3 gallons of water.

Lindane

Make a 0.3-percent spray. Use one of the following mixtures: ½ pound of a 25-percent wettable powder with 5 gallons of water; or 1 pint of a 20-percent emulsifiable concentrate with 8½ gallons of water.

Malathion, Diazinon, and Ronnel

Apply as 1-percent emulsion or wettable-powder sprays. One pound of 25-percent wettable powder of either material, 12 ounces of 57-percent malathion emulsifiable concentrate or 1½ pints of 25-percent diazinon or ronnel emulsifiable concentrate to 5 gallons of water will give the desired concentration of insecticide.

Dibrom

Apply as a 0.6 percent emulsion spray. Mix 2 ounces of 64.5-percent emulsifiable concentrate in 2 gallons of water to make the proper concentration of insecticide.

POISONED BAITS

Poisoned baits control house flies in some places where sprays fail, particularly in unscreened dairy barns and in poultry houses. If properly applied, they can be used in most farm buildings without harming domestic animals. The baits described here are not approved for use in the homes, milkrooms, and restaurants.

The effective poisons are malathion, diazinon, ronnel, Dibrom, DDVP, and Dipterex. Ready-to-use dry baits containing these poisons are on the market.

Making a Bait

Try to buy a ready-to-use bait. If it is not available, buy an emulsifiable concentrate or wettable powder of one of the approved insecticides and make a bait.

Liquid Bait

Make a liquid bait by mixing an attractant—molasses, sirup, or sugar—and one of the poisons with water. Mix 12 ounces of an attractant in 1 gallon of water. The amounts of insecticide to add to the water-attractant solution are given in the tabulation that follows.

Insecticide	Emulsi-fiable concentrate	Wettable powder
	Tablespoons	Tablespoons
Dipterex-----	-----	1
Diazinon-----	1	2
DDVP-----	1	-----
Dibrom-----	1½	-----
Malathion-----	6	24
Ronnel-----	20	20

Dry Bait

A dry bait can be made by mixing a wettable powder of an insecticide in granulated sugar. Add about $\frac{1}{4}$ teaspoon of lampblack per pound of sugar. Stir with a paddle until all the grains of sugar are coated with poison and colored a dirty gray. Coloring the poisoned sugar with lampblack prevents mistaking it for ordinary sugar. The amounts of wettable powder to mix with 1 pound of sugar are given below.

GUIDE FOR MIXING A DRY BAIT

Insecticide	Tablespoons
Dipterex-----	2
Malathion-----	5
Diazinon-----	2½
Ronnel-----	2½

Cornmeal Bait

A cornmeal bait is recommended for use on moist surfaces, where a dry sugar bait would dissolve.

While stirring 1 pound of coarsely ground cornmeal, slowly add the following:

- 1 tablespoon of peanut oil.
- Wettable powder of Dipterex, malathion, diazinon, or ronnel. (For proper amount, see "Guide for Mixing a Dry Bait.")
- 2 ounces of powdered sugar.

Stir with a paddle until all the meal particles are coated with the sugar and the wettable powder. Five minutes' stirring insures proper

mixing of quantities of 1 to 5 pounds. Mixing of larger quantities by hand is not recommended.

Applying the Bait

Frequency

When flies are numerous, spread bait daily. When fewer flies are seen, spread bait once every 3 or 4 days. If flies again become numerous, increase frequency of application.

How and Where

If you buy a *ready-to-use dry bait*, apply it according to the directions on the container.

Apply *homemade liquid bait* with an ordinary sprinkling can. Plug about half the holes so that the bait will spread thinly in strips 4 to 6 inches wide on floors. If the floors are covered with dirt or litter, sprinkle the bait on sheets of tin, wood, paper, or other material.

For control in and around poultry houses, sprinkle the bait where poultry cannot reach it—under the cages, on window ledges, in feed rooms, on sacks or boards, and outside where flies gather. Be careful not to contaminate feed, water, or utensils.

Apply at the rate of 1 gallon to 1,000 square feet.

Apply *homemade, dry sugar bait* with a shaker-top can. Sprinkle thinly in narrow strips on floors, walkways, window sills, and other places where flies gather, but not where it will contaminate animal feed, water, human food, or utensils. Use it only on dry, firm surfaces. On loose material, such

as straw, the bait may fall where flies cannot get to it.

Apply at the rate of 3 tablespoons per 1,000 square feet—or about $\frac{1}{4}$ pound for an average-size barn (one with 2,000 to 4,000 square feet of floor). Use larger quantities if flies are numerous.

Apply *cornmeal bait* at the rate of 2 to 4 ounces per 1,000 square feet in barns or sheds. A higher rate—4 to 8 ounces per 1,000 square feet—may be necessary in open places; the rate depends on the condition of the surface and on the abundance of flies.

PAINT-ON BAIT

Neither a dry bait nor a liquid bait gives good control of flies in animal pens in which the ground is trampled, littered, or muddy.

A paint-on bait usually gives good control in these places. It is applied with a paintbrush to suitable surfaces nearby, such as posts, railings, or board fences. Corn sirup, blackstrap molasses, or a thick water-and-sugar slurry containing 1 percent of malathion, diazinon, Dipterex, or ronnel, or 0.5-percent Dibrom or DDVP makes a satisfactory paint-on bait. The amounts of insecticide to mix in 1 gallon of attractant are listed below.

Insecticide	Emulsi-fiable concentrate	Wettable powder
	Tablespoons	Tablespoons
Dipterex-----	-----	10
Diazinon-----	10	20
Dibrom-----	1 $\frac{1}{4}$	-----
DDVP-----	2 $\frac{1}{2}$	-----
Malathion-----	4	20
Ronnel-----	10	20

Apply the bait whenever flies become numerous. Paint or daub it on. If it is not destroyed by rain, one application is effective about a week.

If you apply bait to a fence around a pen, apply it only to the outside.

A fence around an average-size calf pen or pigpen can be adequately treated with 2 quarts of bait.

PRECAUTIONS

In general.—Insecticides are poisonous to people and to animals; handle them carefully. Avoid contact with poison baits or concentrates. If you spill any on the skin, wash immediately with soap and water; if you spill it on your clothing, change immediately. Wash hands thoroughly after spreading bait. Avoid breathing dust or mist. Do not spray oil solutions near an open flame. Do not contaminate animal feed, water, milk, or milking equipment. Keep insecticides where children, pets, or livestock cannot reach them.

Barn sprays.—Do not use DDT or chlordane in poultry houses, dairy barns, or milk rooms. Do not use lindane in poultry houses. Remove animals from dairy barns before using methoxychlor sprays.

Home sprays.—Use only products specifically labeled for use in homes.

MANURE DISPOSAL

House fly control on the farm is made easier by proper disposal of the manure that accumulates in and around stables, dairy barns, pig-feeding lots, and poultry houses.

GARBAGE DUMPS AND PACKING PLANTS

House flies that breed in municipal garbage dumps can be controlled by applying one of the poisoned baits discussed in this leaflet. Apply either a liquid or a dry bait. Apply liquid bait at the rate of 5 to 10 gallons per acre. Apply dry bait at the rate of 5 to 10 pounds per acre.

Flies that breed in wastes around vegetable- and fruit-packing plants can be controlled by spreading poisoned baits, spraying waste material with insecticide, applying surface sprays outside the plant where flies gather, applying surface sprays inside the plant before packing operations begin, and by using space sprays inside the plant after operations begin. Spraying waste material with insecticide may be hazardous to birds and other wildlife.

For maximum control, remove manure daily and scatter it on fields. Spread it thinly so that fly maggots will dry out and be killed.

When this is impracticable, store manure in boxes or pits, where flies cannot reach it. Boxes or pits made of concrete are the most satisfactory.

Another method is to pile manure in a rectangular rick, preferably on a concrete base. Keep the rick

packed down. Keep the sides vertical; use a spade to trim and pack. Dig a ditch around the rick and pour crude oil into it. Heat generated in the manure will kill many maggots and drive the rest to the surface. Many of those driven to the surface will drop into the oil-filled ditch and be killed.

GRIDS AND TRAPS

Electric grids mounted in the open, or attached to window and door screens, kill many flies but may not produce satisfactory control.

An electric grid consists of parallel wires, about $\frac{1}{4}$ inch apart, connected to a high-voltage, low-amperage circuit. Insects that try to pass between any two wires are electrocuted.

Flies can be attracted to the grid with bait. A good bait: 1 part of molasses mixed with 3 parts of water, milk, or fruit waste.

Several kinds of traps are used in places where flies gather. Among them are ready-made traps equipped with electric grids, homemade or commercial screen traps, and jar traps. Bait attracts flies to these traps.

Prepared by
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